

Management and outcomes of antepartum haemorrhage in women delivering at Harare Maternity Hospital

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Abstract

Background: Antepartum haemorrhage and its complications are responsible for a significant proportion of maternal and neonatal morbidity and mortality worldwide.

Objectives: To assess the prevalence, maternal and perinatal morbidity and mortality as well as to evaluate the management rendered to women presenting with antepartum haemorrhage who delivered at Harare hospital during the study period.

Study Design: Prospective cross sectional study carried out on 125 women recruited between August and December 2014.

Setting: Harare Maternity Hospital, Zimbabwe.

Main Outcome Measures: The study evaluated demographic data, clinical diagnosis, maternal and neonatal complications and management of antepartum haemorrhage cases.

Results: A total of 6033 deliveries were recorded and 125 had antepartum haemorrhage giving a prevalence of 2.1%. The clinical diagnosis was placental abruption 49 (39.2%), placenta praevia 44 (35.2%), indeterminate 18 (14.4%), heavy show 12 (9.6%) and ruptured uterus 2 (1.6%). Mean age was 29 years (range 17-43) and a modal parity of 2. Evaluation of management of cases revealed that insertion of large bore cannula, cross matching of blood, catheterisation were achieved in 70-80% of cases. Maternal complications included postpartum haemorrhage 50 (40%), need for transfusion 41 (32.8%) and caesarean hysterectomy 4 (3.2%). Maternal deaths, 5 (4%) were all due to placental abruption. Preterm births accounted for 44.8% of deliveries and 53.6% of the live births were admitted to neonatal unit. Stillbirths occurred in 3 (6.8%) of placenta praevia and 35 (71.4%) of placental abruption and 3 (9.4%) were due to other causes.

Conclusion: The study showed a prevalence of antepartum haemorrhage of 2.1% and considerable maternal and perinatal morbidity and mortality attributable to antepartum haemorrhage. There were gaps in adhering to the management protocol.

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Introduction

Antepartum haemorrhage is defined as bleeding from or into the genital tract occurring from 24+0 weeks of gestation or after fetal viability and prior to birth of the baby. The most important causes of antepartum haemorrhage are placenta praevia and placental abruption. Antepartum haemorrhage complicates 3-5% of pregnancies and is a leading cause of perinatal and maternal mortality worldwide.¹ Locally and for the purpose of this study the definition of antepartum haemorrhage referred to bleeding from or into the genital tract occurring after 28 weeks of gestation prior to delivery of the baby. This is because our neonatal units are not well resourced to enable neonates born

before 28 weeks to survive. Antepartum Haemorrhage is one of the leading causes of maternal and perinatal mortality and morbidity in Zimbabwe. Information from Maternity delivery registers and Neonatal Deaths Register (Harare Central Hospital) in 2013 revealed that 5 out of 77 maternal deaths were due to antepartum haemorrhage and all cases were noted to be avoidable (unpublished data). At the time of the study the contribution of antepartum haemorrhage to maternal morbidity and mortality at Harare Maternity Hospital was largely unknown.

Materials and Methods

This was a prospective Cross sectional Study

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conducted at Harare Maternity Hospital, a tertiary hospital which is the main referral centre for the greater Harare Unit (municipal clinics in the Harare urban area), district and provincial hospitals. It is also a teaching hospital of the University Of Zimbabwe College Of Health Sciences.

The objectives of the study was to assess the prevalence of antepartum haemorrhage and maternal and perinatal morbidity associated with antepartum haemorrhage and also to assess the maternal and perinatal mortality associated with antepartum haemorrhage. The management rendered to patients presenting with antepartum haemorrhage at Harare Maternity Hospital was also evaluated. Women included in the study were those admitted and managed for antepartum haemorrhage after 28+0 completed weeks of gestation who went on to deliver at the hospital. Women excluded from the study included those who were unwilling to consent to take part in the study, those who had multiple pregnancy and those carrying foetuses with confirmed congenital abnormalities.

Study factors evaluated included demographic data, antepartum haemorrhage clinical diagnosis, antenatal ultrasound scan assessment, mode of delivery, use of non pneumatic antishock garment, operative interventions, postpartum haemorrhage, transfusion, duration of hospital stay, admission to intensive care unit, maternal death and neonatal outcomes which included: - live births, apgar score less than 7 after 5 minutes, admission to neonatal unit, preterm delivery, birth weight and neonatal death. Postpartum haemorrhage referred to any estimated blood loss more than 500mls following vaginal delivery or more than 1000mls following a caesarean section. Transfusion was defined as infusion of any blood product. Maternal death referred to death of a woman while pregnant or after she had been managed for antepartum haemorrhage within the time period of admission. Neonatal death referred to death of infant following live birth up to 28 days and was defined as early neonatal death if it occurred within 7 days. Preterm delivery referred to birth of an infant before 37 completed weeks by dates or ultrasound scan.

A standard based audit was designed from the local protocol for evaluating the management of antepartum haemorrhage. The information was collected from the case notes and any information not recorded was regarded as not done. This is illustrated in table III.

Data collection was done on women who met the inclusion criteria using convenience sampling after they had been admitted at Harare Maternity Hospital. Recruitment of mothers was done upon delivery after they had been managed for antepartum haemorrhage during the antenatal or intrapartum period through review of delivery register and case notes. Once selected for the study, each patient would go through the process of informed consent and signed the consent form. The diagnosis of each case was made by the team of doctors managing the women upon admission. A

diagnosis of placenta praevia was based on clinical presentation of painless bleeding in the presence of a relaxed uterus, retrospective confirmation of placental site after delivery (for example upon doing a caesarean section) or a low lying placenta confirmed by ultrasound scan. A diagnosis of placenta abruption was based on clinical parameters of bleeding associated with uterine contractions and tenderness, +/- fetal distress or fetal death and or confirmation after delivery of a retroplacental clot. Diagnosis of other causes of antepartum haemorrhage was based on clinical findings depending on the particular cause depending with the case. When an identifiable particular cause for antepartum hemorrhage was not found the diagnosis was made inevitably indeterminate.

There was no intervention to the management of the patient and decisions made were solely based on the team managing the patient or the team on call. After delivery in early labour ward, women were discharged to postnatal wards if stable. Follow-up of the mothers was done until they were discharged from hospital. Upon delivery, neonates were either given to the mother or admitted in neonatal unit if indicated. Neonates were followed up to day 28 post delivery. This was made possible by calling the parents about a month after they had been discharged from hospital to find out if the child was alive and well.

Statistics

Sample size was calculated using this Dobson's Formula:

$$n = \frac{Z^2 1-\alpha/2 P(1-P)}{e^2}$$

Where n = sample size

$$Z^2 = (1.96)^2 \text{ for } 95\% \text{ confidence (i.e. } \alpha = 0.05).$$

$$p = \text{"best guess" for prevalence (0.03).}$$

This is based on a study quoted in the literature review done by Abegbola on patterns of antepartum haemorrhage in Nigeria, an African population which is comparable to our local population (2).

e = maximum tolerable error for the prevalence estimate (± 0.030) because prevalence is estimated to be less than 5%. The sample size for the study was 125.

All women who fitted into the eligibility criteria were included. Data collected was entered into a statistical package SPSS version 16 and analysed. Chi-square test was used to compare categorical variables and T-test used for continuous variables and a p value of ≤ 0.05 was considered significant.

Ethics

Approval from Harare Central Hospital ethics

Results

Table I: Criteria and standard audit tool.

Patient managed for antepartum haemorrhage	Standard (%)
Insertion of 2 large bore cannulas for resuscitation	100
Full blood count	100
Cross match of blood	100
Crude clotting time	100
Catheterisation	100
Active management of third stage of labour for all cases	100
If patient managed for placental abruption:	
Delivery within 6-8 hours	100

During the study period from August to December 2014, 129 women were managed for antepartum hemorrhage and delivered at the hospital. Four women were removed from the analysis. Two had gestational age less than 28 completed weeks, one did not consent to take part in the study and one woman had multiple pregnancies. One hundred and twenty five (125) were available for the final analysis. During the same period there were 6033 deliveries at the hospital giving a

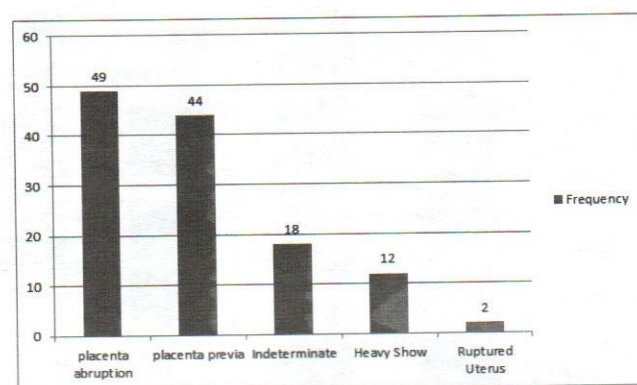
Table II: Demographic Data.

	Placenta praevia		Placenta abruption		other		Total	
	n	%	n	%	n	%	n	%
Age distribution:								
<20	5	11.4	4	8.2	3	9.4	12	9.6
20-35	33	75.0	39	79.6	27	84.3	99	79.2
>35	6	13.6	6	12.2	2	6.3	14	11.2
Marital status:								
Single	0	0.0	4	8.2	1	3.1	5	3.2
Married	44	100	45	91.8	31	96.9	120	96.8
Parity:								
0	8	18.2	13	26.5	4	12.5	25	20.0
1	16	36.4	10	20.4	10	31.3	36	28.8
2	13	29.5	16	32.7	10	31.3	39	31.2
3	5	11.4	6	12.2	6	18.6	17	13.6
4	2	4.5	3	6.1	2	6.3	7	5.6
5	0	0.0	1	2.0	0	0.0	1	0.8
Booking status:								
Booked	36	81.8	35	71.4	24	75.0	95	76.0
Unbooked	8	18.2	14	28.6	8	25	30	24.0
HIV status:								
Negative	30	68.2	31	63.2	23	71.9	84	67.2
Positive	7	15.9	9	18.4	4	12.5	20	16
Unknown	7	15.9	9	18.4	5	15.6	21	16.8
Obstetric antenatal ultrasound scan:								
Not done	12	27.3	27	55.1	19	59.4	58	46.4
Done	32	72.7	22	44.9	13	40.6	67	53.6

Assessment of ultrasound scans done antenatally showed that 53.6% had at least one ultrasound scan done during the current pregnancy and 46.4% had none done. Vaginal deliveries occurred in 63 (50.4%) women whilst 62 (49.6%) women had caesarean sections done for all cases of antepartum haemorrhage. The majority of those managed for placenta praevia delivered by caesarean section 38 (86.4%) as compared to 6 (13.6%) who delivered vaginally. On the other

prevalence of antepartum hemorrhage of 2.1%. The causes of antepartum hemorrhage are shown below.

Figure I: Causes of antepartum haemorrhage.



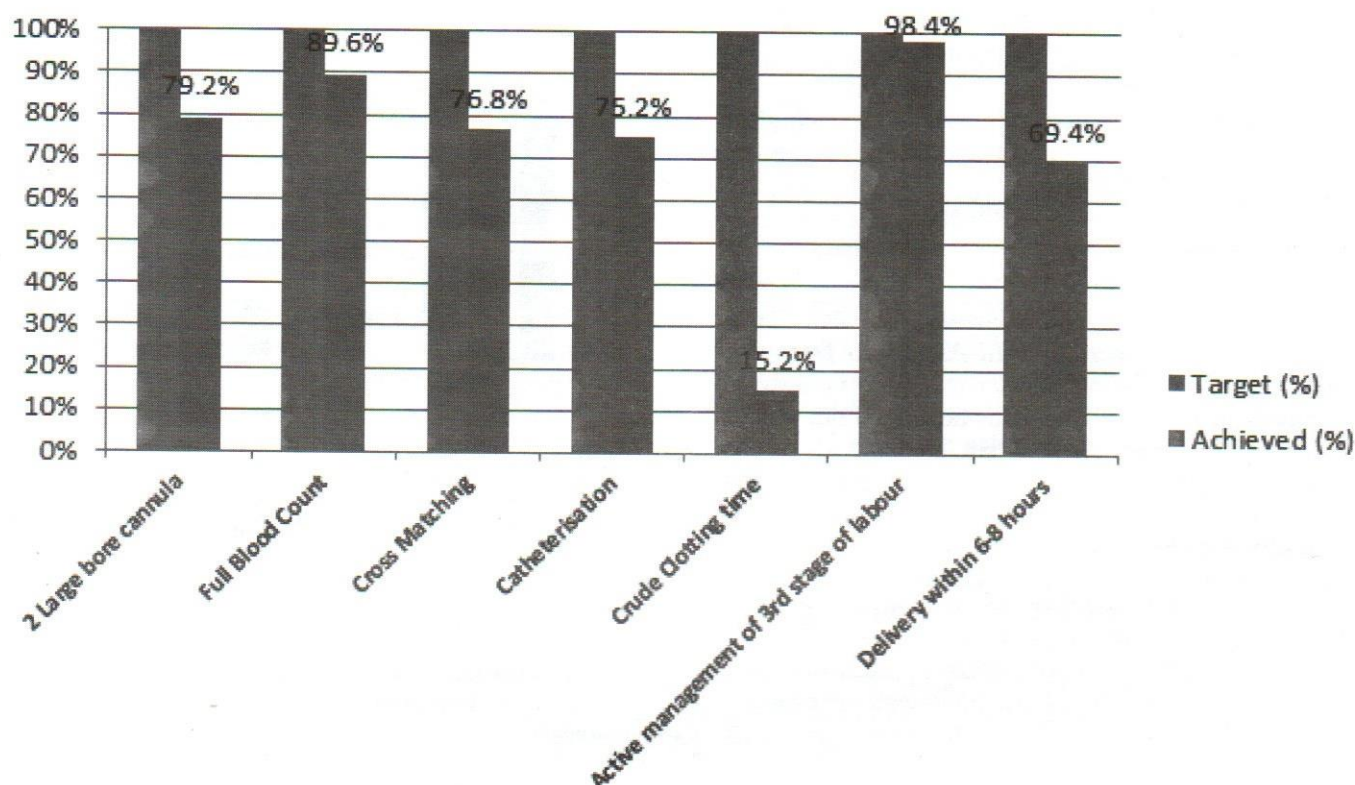
Indeterminate, heavy show and ruptured uterus were grouped into one pool of causes noted as, "Other", for further analysis. This group contributed 25.6% to the causes.

hand, the majority of patients with placental abruption delivered vaginally 34 (69.4%) and 15 (30.6%) had caesarean section done with the main indication for the procedure being the clinical diagnosis of the presence of fetal heart and these were confirmed postpartum by the presence of a retroplacental clot. This resulted in delivery of 13 live neonates.

Evaluation of management of antepartum haemorrhage using the standard based audit tool was

revealed in figure II below.

Figure II: Bar graph showing Target and Achieved proportion for each parameter.



The tables III and IV below, show maternal and neonatal outcomes.

Table III: Maternal outcomes.

	Placenta praevia n=44		Placenta abruption n=49		Other n=32		Total n=125		p value
		%		%		%		%	
Postpartum haemorrhage	18	40.9	25	51.0	7	21.9	50	40.0	0.036
Hysterectomy	0	-	2	4.1	2	6.3	4	3.2	0.000
*Brace sutures during c/sections	7	18.4	1	6.7	0	-	8	12.9	0.0004
Repeat laparotomy	0	-	0	-	0	-	0	-	-
Antishock garment	0	-	5	10.2	0	-	5	4.0	0.012
Transfusion	18	40.9	22	44.9	1	3.1	41	32.8	0.010
ICU admission	0	-	3	6.1	1	3.1	4	3.2	0.008
Maternal deaths	0	-	5	10.2	0	-	5	4.0	0.028

*Denominator = caesarean sections done for each group.

Table IV: Foetal outcomes.

	Placenta praevia n=44		Placenta abruption n=49		Other n=32		Total n=125		p value
		%		%		%		%	
Live birth	41	93.2	14	28.6	29	90.6	84	67.2	0.000
Preterm delivery	21	47.7	24	48.9	11	34.4	56	44.8	0.250
Still birth (macerated + fresh still births)	3	6.8	35	71.4	3	9.4	41	32.8	0.000
Early neonatal deaths	4	9.1	2	4.1	3	9.4	9	*10.7	0.640
Perinatal deaths	7	15.9	37	75.5	6	18.6	51	40.8	0.000
Neonatal deaths	6	14.6	2	14.3	3	10.3	11	*13.1	0.230
Admission to Neonatal Unit	24	58.5	8	57.1	13	44.8	45	53.6	0.294
Apgar score <7 after 5 minutes	13	29.5	4	28.6	4	13.7	21	*25	0.757

Denominator is live births.

Discussion

Mean age of the study participants was 29 years. This is in contrast to the traditional association of antepartum haemorrhage with advanced maternal age.³⁻⁵ The prevalence of antepartum haemorrhage was 2.1% which is within the range recorded in studies in developed countries which is 2-5%.⁶ This is comparable to the prevalence of 3.01%, 3 % and 1.5% found by Singhal, Abegbola and Adenkale respectively in studies assessing maternal and perinatal outcomes in patients with antepartum haemorrhage.^{2,7-8}

The commonest cause of antepartum haemorrhage in the study was placental abruption 39% (n=49), followed by placenta praevia 35.2% (n=44) while other causes contributed about 26.5%. This was contrary to findings in other studies. Chan and others done in a tertiary hospital in China, found that main causes of antepartum haemorrhage were placenta praevia 31%, placenta abruption 22% with other causes contributing 47%.⁹ Agegbola in 2009 looked at patterns of antepartum haemorrhage at a teaching hospital in Lagos, Nigeria and found that placenta praevia contributed 58.4% and abruption contributed 35.6%.² This was also similar in another study in Nigeria by Adenkale which showed that placenta praevia contributed 55.6%, placental abruption 33.3% and unknown causes proportion of 8.4%(8). This may signify that the contribution of the causes of antepartum haemorrhage may differ depending on the region and population studied.

Maternal morbidity outcomes in the study revealed that 40% of women had postpartum haemorrhage. When the three groups were compared, postpartum haemorrhage occurred in 25 (51%) of placental abruption cases, 18 (40.9%) of placenta praevia and other diagnoses of antepartum haemorrhage were least likely to have postpartum haemorrhage 7 (21.9%). This is supported by other studies which have shown that antepartum haemorrhage arising from placenta praevia and placental abruption is associated with increased risk of postpartum haemorrhage.¹⁰⁻¹¹

Five women with placental abruption had non pneumatic antishock garment used on them, accounting for just 4% usage for all antepartum haemorrhage cases and three of these cases required intensive care unit admission. This may signify the fact that most patients did not have severe hemorrhagic shock warranting its use and admission to a high care unit or that some clinicians don't appreciate the importance of this garment in stabilising patients in shock. In a systematic review by Castro and others, they concluded that the non pneumatic antishock garment is a temporary alternative measure in postpartum haemorrhage management that shows a trend to reduce postpartum related deaths and severe morbidities.¹³

Caesarean hysterectomies were done in 4 cases (3.2%). Two of the cases had severe haemorrhage

because of complications of placental abruption and the other two had ruptured uterus which could not be repaired. Women with ruptured uterus may present as antepartum haemorrhage and are at risk of maternal morbidity and mortality. Clinical suspicion should result in aggressive management in order to reduce severe complications. Of note in the study is that there were no repeat laparatomies post caesarean sections. Repeat laparatomies may be expected post caesarean sections because of the high risk of postpartum haemorrhage secondary to poor contractility of the lower segment and morbidly adherent placentas as expected in some cases of abnormal placentation.

Women who were managed for placenta praevia and placental abruption were more likely to have transfusion of blood products (40.9% and 44.9% respectively) as compared to the pooled group of other diagnoses (3.1%). The overall proportion of cases transfused was 32.8%; which was much higher as compared to that found by Adenkale and others, in a study in Nigeria which was 12.4%.⁸

The case fatality rate for the study was 4%. This was as a result of five maternal deaths because of placenta abruption and its complications. All the cases had estimated blood loss of at least 1500mls with associated coagulation disorders. A review of the cases showed that the deaths could have been avoided if there was availability of blood products at the blood bank. This occurred later on during the course of the study when donated blood coupons meant to avail free blood products ran out and patients were unable to receive blood products unless they paid for them upfront. Two of the cases had also other co-morbidities, one being managed for type one diabetes and the other one was HIV positive being managed for gastroenteritis upon presentation to the unit.

Placenta abruption was associated with a high perinatal morbidity and mortality as compared to placenta previa or pooled group of other diagnoses as highlighted by 24 (48.9%) preterm births, 35 (71.4%) still births and 37 (75.5%) perinatal deaths. This may signify the fact that patients presenting with placenta abruption were mostly class 3, which is the severe form of the disease. Perinatal mortality rate for placenta praevia was much lower than that for placental abruption (159 vs. 755 per 1000 total births). This is supported by a study by Siddiqui done in Karachi, Pakistan in which it was noted that stillbirth and perinatal mortality rates were significantly higher in placental abruption than placenta praevia.¹⁴

It was of interest to note the proportion of live births in placental abruption which was 14 (28.6%). Thirteen of these live births were delivered through caesarean sections with the main indication for the procedure being the diagnosis of placental abruption and presence of a viable fetus.

More than half of live births 45 (53.6%) were admitted in the neonatal unit. Major reasons for admission to neonatal unit in this study included low

apgar, prematurity and low birth weight. A study done at Lautech Teaching Hospital in Nigeria, showed that admission to Neonatal unit for cases of antepartum haemorrhage was 33.3%.⁸ This proportion was much lower than that recorded in this study.

A standard based audit was included in the study to assess the management of antepartum haemorrhage. Full blood count and active management of the 3rd stage of labour (89.6% and 98.4% respectively) were the only parameters done which attained at least 80% achievement of the target. High proportion of achievement on management of the 3rd stage of labour could be attributable to the good midwifery and obstetric practice in the unit. A Cochrane review found that active management of third stage of labour was associated with lower maternal blood loss and with reduced risks of postpartum haemorrhage.¹⁵ However, there were a high proportion of cases (40%) that ended up having postpartum haemorrhage despite active management. This may be explained by the already high risk of postpartum haemorrhage associated with antepartum haemorrhage as compared to uncomplicated pregnancy deliveries.

The least achieved parameter was crude clotting time, assessed in only 15.2% of cases. Women diagnosed with placental abruption may have disseminated intravascular coagulation as a complication. Despite this only 13 (26.5%) of placental abruption cases were assessed for this parameter and it was hardly assessed in the other diagnoses. The full clotting profile was hardly ordered by the managing teams probably because laboratory facilities for this test are not always available. In the management of antepartum haemorrhage cases insertion of two large bore cannulas, cross matching of blood and catheterisation are crucial steps which should be done. In this study these parameters were achieved in between 70 to 80% of cases. This could be contributed to by the unavailability of resources in the unit, in which some essential items are in and out of supply. Achievement of less than 80% for cross matching of blood in the management of antepartum haemorrhage cases is unacceptable because of known complications like postpartum haemorrhage and disseminated intravascular coagulation.

Improvement in the management of antepartum haemorrhage could be done by making resources available as well exposing health care providers to obstetric drills. Sequential reports investigating maternal deaths in the United Kingdom have highlighted the importance of obstetric haemorrhage skill drills.¹⁶⁻¹⁷ Half of the women in the study were delivered by caesarean section with the majority of placenta praevia cases being delivered by caesarean section (86.4%). However, a relatively lower caesarean section rate for cases of placental abruption in the study 30.6%, was comparable to those found by other authors, Sarwar *et al* found 30.2% and Bibi *et al* found 27%.¹⁸⁻¹⁹

Conclusion

The study showed a prevalence of antepartum haemorrhage of 2.1% in women who delivered at Harare Maternity Hospital and of note was considerable maternal and perinatal morbidity and mortality attributable to antepartum haemorrhage. There were gaps in adhering to the management protocol.

Study Limitations

Diagnosis of cases in the study was at the discretion of the different teams managing the women at the particular point at which they presented to the unit. The study could only capture information which had been recorded in the case notes which was occasionally incomplete. Postpartum haemorrhage assessment was based on estimates. This could have resulted in inter observer variation and underestimation of actual blood loss. Follow up of neonates could only be done by phoning the mothers. Assessment of well being could have been done better by doing home visits and physically examining the neonates.

Recommendations

Obstetric drills need to be instituted in the units to all midwives and doctors to improve management of antepartum haemorrhage. There should be constant availability of blood products and funding for blood products.

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REVIEW ARTICLE

Open heart surgery: the Zimbabwean experience

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Introduction

Cardiac surgery is not readily available in most sub-Saharan countries and where available it is usually performed in small numbers.¹ Open Heart Surgery (OHS) recommenced in Zimbabwe in 2016 after a 14 years hiatus. During the cessation some

patients had surgery abroad whilst only medical treatment was available locally.

Despite efforts to develop OHS in most Sub-Saharan countries, the programs have not been sustainable.² This paper reviews the process of setting up an OHS program in a resource limited setting focusing on our experience in Zimbabwe.

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